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APPLICATION NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO.
08/578,980	12/27/95	KAMAKURA	T 39-5461-0

B5M1/0415
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EXAMINER

WILLE, D
ART UNIT PAPER NUMBER

2508

DATE MAILED: 04/15/97

This is a communication from the examiner in charge of your application.
COMMISSIONER OF PATENTS AND TRADEMARKS

OFFICE ACTION SUMMARY

- ☐ Responsive to communication(s) filed on _____
- ☒ This action is **FINAL**.

- ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 D.C. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

- ☒ Claim(s) 1-10 is/are pending in the application.
Of the above, claim(s) _____ is/are withdrawn from consideration.
- ☐ Claim(s) _____ is/are allowed.
- ☒ Claim(s) 1-10 is/are rejected.
- ☐ Claim(s) _____ is/are objected to.
- ☐ Claim(s) _____ are subject to restriction or election requirement.

Application Papers

- ☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.
- ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- ☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.
- ☐ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- ☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been
- ☐ received.
- ☐ received in Application No. (Series Code/Serial Number) _____
- ☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

- ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- ☐ Notice of Reference Cited, PTO-892
- ☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____
- ☐ Interview Summary, PTO-413
- ☐ Notice of Draftsperson's Patent Drawing Review, PTO-948
- ☐ Notice of Informal Patent Application, PTO-152

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--SEE OFFICE ACTION ON THE FOLLOWING PAGES--

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DETAILED ACTION

Claim Rejections - 35 USC § 112

1. Claims 8, 9, and 10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
2. Claims 8, 9, and 10 refer to a dense layer. This term is not defined and does not correspond to the usual meaning of dense. These claims also refer to the lattice constant as being 10^{-2} . This is not understood since a lattice constant should have dimensions and second, it is in a range which is not physical, no matter what the dimensions.

Claim Rejections - 35 USC § 102

3. Claims 1 and 3 are rejected under 35 U.S.C. 102(b) as being anticipated by Scifres et al. See previous Office Action for a discussion of this rejection.

Claim Rejections - 35 USC § 103

4. Claims 2 and 8, 9, and 10, as far as they are understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Scifres et al in view of Inoue et al.
5. For a discussion of claim 2 rejection see the previous Office Action. With respect to claims 8, 9, and 10, Scifres et al discusses the basic device structure and refers to the strain layer

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thickness as being approximately 10 nm(column 4, line 47). Scifres et al also discusses the lattice mismatch as being less than or equal to 4%. Inoue et al discusses the defect density as being in the range of $10^6 / \text{cm}^2$ which corresponds to a value greater than $10^4 / \text{cm}^3$. It would have been obvious to provide the Scifres et al device with the defect density taught by Inoue et al to improve the defect protection.

6. Claims 4, 5, and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Scifres et al in view of Sugawara et al. See previous Office Action for a discussion of this rejection.

7. Claim 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Scifres et al in view of Sugawara et al and further in view of Inoue et al. See previous Office Action for a discussion of this rejection.

Response to Arguments

8. Applicant's arguments filed 13 January 1997 have been fully considered but they are not persuasive.

9. Applicant argues that Scifres et al does not discuss details of defect density, lattice constant or layer thickness. While Scifres et al does not discuss defect density, they do discuss both layer thickness and lattice constant differences as noted above. No discussion of defect density was required before the claims were amended and was therefore not addressed, however, in light of the new claims, it is noted that the question of defect density is addressed by the Inoue et al reference. Applicant also argues that Scifres et al does not show the strain layer as being

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between the electrode and the hetero-configuration, but applicants' attention is drawn to Figure 2 where the strain layer is shown as being in the middle of the buffer layer and there is still a buffer material layer between the strain layer and the hetero-configuration.

10. Applicant argues that claims 3, and 4 have features not discussed by Scifres et al. It is noted that Scifres et al teaches a structure where the clad layers are doped for n- and p-type behavior. While Scifres et al does not specify the doping of the active layer, it is standard practice to leave that layer undoped. Thus the features of these claims were properly addressed in the rejection. Applicant also argues that Scifres et al fails to teach the claimed defect layer either in location or material and the defect is not removed by Inoue et al. Applicants' attention is drawn to the discussion above where the location of the defect layer is exactly as shown in the claims and while Scifres et al does not discuss the defect density this is more than made up by the discussion in Inoue et al where the defect density is shown in great detail. Again, all aspects of the claims were discussed in the references provided.

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

12. A shortened statutory period for response to this final action is set to expire **THREE MONTHS** from the date of this action. In the event a first response is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period

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will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event will the statutory period for response expire later than SIX MONTHS from the date of this final action.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Douglas A. Wille whose telephone number is (703) 308-4949.

14. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose number is (703) 308-0956.

DAW *Ddw*

April 2, 1997


SARA W. CRANE
PRIMARY EXAMINER
GROUP 2500